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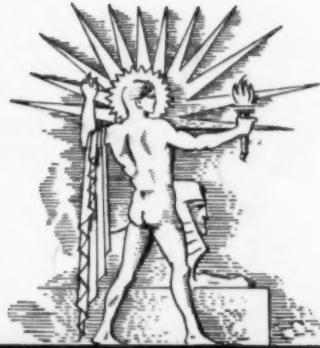
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SCIENCE NEWS LETTER



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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



September 9, 1939

Bible Villain

See page 169



A SCIENCE SERVICE PUBLICATION

Do You Know?

Making textiles from soybean yarn is being tried.

The guitarfish has a big round head and a narrow tail.

A typewriter for writing Persian is on the German market.

About 57 per cent. of the personnel in the Federal Indian Service are Indians.

The majority of state agricultural experiment stations date from the Hatch Act of 1887, though a few are older.

Northwest coast Indians believed that a thunderbird darkened the sky during storms, causing thunderclaps by his beating wings.

How insects can distinguish weak, sickly trees—which they attack in preference to healthy ones—is not yet explained by science.

Over 400 years ago Leonardo da Vinci observed that trees in northern Italy formed growth rings which differed in dry and wet years.

To adapt automobiles for foreign countries where the driver sits at the right, one American manufacturer makes alterations affecting 1,500 parts.

A new chemical way of preserving timothy and alfalfa hay crops without drying and curing in ordinary silos is to treat them with a form of phosphoric acid.

SCIENCE NEWS LETTER

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QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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PUBLIC HEALTH

How is birth control serving to reduce the tuberculosis deathrate? p. 174.

The cabbage rose, with its numerous petals, has been cultivated in Europe for 2,000 years.

Ancient Etruscan funerals sometimes included athletic contests and banqueting at the tomb.

By television, 74 internes, nurses, and doctors in Brooklyn recently witnessed an operation in another room 500 feet away.

The first tool with a handle was probably invented by a Cro-Magnon cave dweller who lived in France some 30,000 years ago.

Fibers of artificial resin are being tried in Germany as a substitute for metal in wired glass.

Tires lose air faster in summer due to the expansion of pores in the rubber, through which air can escape.

A dual-purpose sheep—producing good wool and mutton—has been bred for small-farm operators by federal sheep specialists.

A collection of wild flowers of the Canadian Rockies has been made for Queen Elizabeth, to be planted in gardens of Windsor Great Park.

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PSYCHOLOGY

Propaganda Protection Needed In the United States Today

**Expert Replying to Science Service Inquiry Declares
American People Already Mentally Prepared for War**

War of nerves—war of propaganda. Call it what you will, we in America are to experience the powerful backwash of the European conflict. What we need is psychological protection. What is likely to happen to us, in the opinion of psychological experts: The American people are already mentally prepared to accept war and to accept the fact that sooner or later they will be drawn into it. Propagandists will capitalize on the recent depression by suggesting that through playing the war game we can win back prosperity. The mental effects of war would be as disastrous as the maiming and lethal results of high explosives. Free speech and free press will be lost. Faith in democratic processes will give way to a following of a strong military leader. International hatred will be cultivated and minority groups, including labor organizations, will be persecuted. Mental disease, neuroses, and twisted personalities will develop on a frightfully increased scale. The values and ideals of civilization will be crushed. Fear and horror will rule the world despite the attempts of propagandists to artificially deaden these human emotions.

Science Service has queried leading psychologists in the field of social problems on new methods of propaganda likely to be developed in a new European War and new methods of combatting it. We also asked what would be the effect of such a catastrophe on the mental state of the people of both warring and neutral nations.

PSYCHOLOGY

Official Reasons For War Are Seldom Real Causes

By DR. I. KRECHEVSKY

Secretary, Society for the Psychological Study of Social Issues

THE PRESENT conflict in Europe is not that of democracy versus fascism. It is the final tragic chapter in the politics of power and profits which has dominated the world for more than half a century, but psychologists know well that the official reasons for war are seldom the real causes.

Propagandists knowing that the American people are sincerely anti-fascists will raise the slogan of democracy versus fascism. England and France will be glorified as democracies and thus clever appeals to our highest ideals will be used in the hope that our baser emotions of

aggression will be released with the result that we will be ready to stampede into a war for "democracy" and "do our bit."

Also an attempt will be made to take advantage of our previous economic plight and propagandists will suggest that through playing the war game we can win back prosperity.

The group opposed to our participation in such a war will no doubt attempt to publicize the real issues involved. They will remind the American people of the old slogan used in the last war and will offer a more positive and constructive program for economic security in this country. Such anti-war propaganda will also have to recognize our democratic sympathies and show that by defending and extending democracy and peace at

home, the American people will be working most effectively for democracy the world over.

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PSYCHOLOGY

War Interrupts Natural Activities of Living

By DR. FRANKLIN FEARING

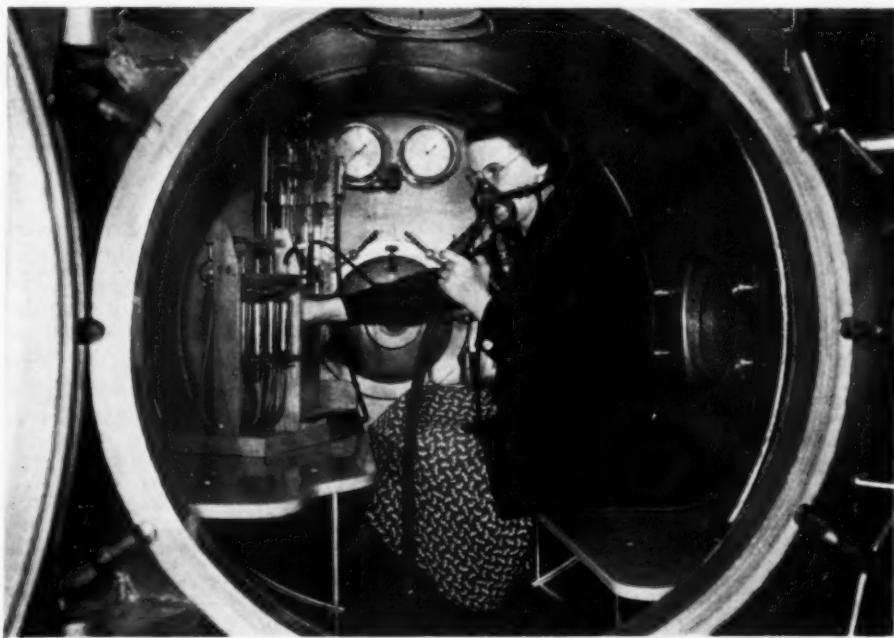
Professor of Psychology, University of California at Los Angeles

THE SITUATION at present is psychologically not the same as in 1916. Constant familiarity with activities of fascist countries has already mentally prepared the American people to accept war, and to accept the fact that sooner or later they will be drawn into it.

The last Gallup poll shows that 76% of the people believed that in event of a European war, we will be involved.

Counter propaganda is not likely to be effective.

The mental effects of war are extremely complex. Among the more important is a loss of faith in democratic processes and an increase in belief that a strong man at the top can save us.



TEST FOR HIGH FLYING

The high altitude tank at the Mayo Clinic's new aviation medicine research laboratory at Rochester, Minn. Such effects as lack of oxygen on the human body and mind, and such questions as how fast can a man descend comfortably and safely can be studied in this tank which, by low pressure, simulates upper air levels. Here a research worker wears an oxygen mask invented by three of the men responsible for this laboratory, Drs. Walter M. Boothby, W. Randolph Lovelace and A. L. Bulbulian. Oxygen is necessary at altitudes above about 9,000 feet.

All forms of social freedom are curtailed, and a fear and persecution of all minority groups, particularly labor organizations, will probably develop.

Since war serves no human or biological need but is essentially a pathological state and violently interrupts all the natural activities of living, its effects on all participants are serious.

If war is prosecuted for a long period, it is necessary to artificially inflate enthusiasm and to artificially deaden normal reactions of fear and horror. This is likely to result in serious psychological changes in the individual and to increase the psychoses of frustration.

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PSYCHOLOGY

War Propaganda Success Depends Upon Rousing Hate

By DR. ROSS STAGNER

University of Colorado

PROPAGANDA designed to involve United States in war will take the form of glorifying one side of the European conflict while vilifying opposed countries.

The success of propaganda depends upon arousing emotions of anger, hatred and fear. Its effects can be neutralized by trying to see both sides, avoiding policies based on revenge and intimidation, doubting atrocity stories, shunning name calling, remembering that national governments do not publish true facts on national disputes.

Our studies emphasize that American people hate war but by allowing emotion to sweep away reason they may be plunged into it.

Appeals to our highest ideals may be shrewdly planned to let loose our most destructive emotions.

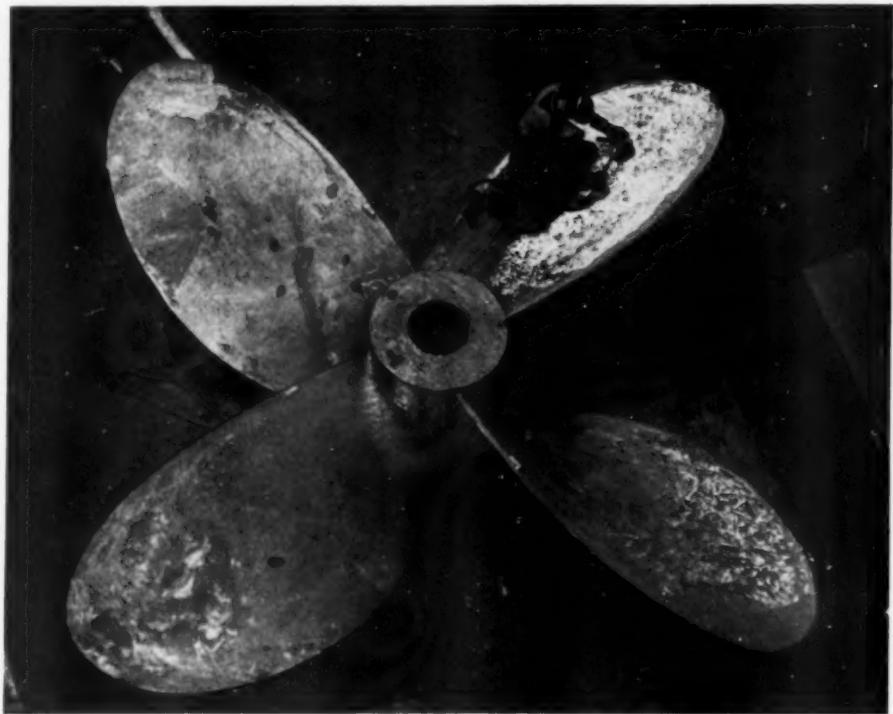
If the United States is drawn into war, we shall have censorship, destruction of free speech and preaching of international hatred on an unprecedented scale.

Here, as elsewhere, will occur a frightful increase in neurosis, insanity and twisted personalities.

Civilized values and democratic ideals will be crushed. The psychological effects will persist for twenty years or more.

Psychologists appraising this crisis plead for caution, reason and delay in judgment until facts are clear, warn against quick condemnation based on possibly distorted information.

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ONE OF TWINS

Polishing one of the America's propellers. Two such giants, which must be hand-finished, will be driven by geared turbines to take the ship across the Atlantic in a comfortable, economical seven days.

ENGINEERING

Newly Launched Liner Is Safest Ship in The World

THE S. S. AMERICA, launched on August 31, is not only the largest passenger vessel ever built in the United States but is the safest ocean liner in the world. Its design, naval architects of the Newport News Shipbuilding and Drydock Company, its builders, and the U. S. Maritime Commission unite in saying, incorporates a great many unusual features.

The America will never burn like the Morro Castle, the Paris, Atlantique and Georges Philipp. Fireproof construction featuring marinite, an asbestos-based material for paneling, brick and partition filler, is being used throughout. All the vessels under construction or called for in the Maritime Commission's program for rebuilding the merchant marine are similarly designed, but only a few vessels incorporating it have been finished. The America will be the largest fireproof steamship afloat.

Wood construction between state-

rooms and other enclosures, and wood paneling throughout, are the source of fire danger in ocean liners. Only a small amount of wood paneling will be in the ship and because of the wide use of marinite, it is not at all dangerous. Marinite was proved to be a successful fire-proofing material in tests aboard the S. S. Nantasket, conducted following the Morro Castle disaster.

The America is about 40% complete today. It will be finished in what is known as a "fitting basin." Its displacement will be about 34,000 tons. Its gross register tonnage, which will not be known exactly until the ship has been finished, will be about 26,000 tons as compared with more than 80,000 gross register tons for the Queen Mary and the Normandie. Gross register tonnage, most frequently used as a measure of a passenger vessel's size, has nothing to do with weight but is a measure of the space enclosed by the hull, decks and

superstructure. Much larger vessels than the America have been built in the United States but they are all warships.

A special acoustical ceiling in the freight holds will prevent the irritating noise of cargo handling from bothering passengers aboard the vessel while in port. The America, which will not be a fast vessel, since it will require about seven days to make the Atlantic crossing, has a flush-riveted hull below the water-

line to cut resistance to its passage and reduce wasted horsepower.

A sample stateroom, designed by Gibbs and Cox, the ship's designers retained by the United States Lines which will operate the America, was built while the vessel was still on the ways. It has helped in working out the basic plan of passenger accommodations. There will be about 400 staterooms altogether. Passenger capacity is to be 1219.

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shells fired across the field of focus of fixed cameras, on the artillery proving grounds.

Not that anybody expects future planes to travel as fast as artillery projectiles. Speeds more than about twice the highest now attainable with special racing planes impose such stresses that no practical way is even remotely in sight, of building aircraft parts that could stand up to them.

The contribution of flying shells to flying machines is expected to be a better scientific understanding of how air resistance against various shapes of "nose" builds up those stresses. At present velocities, such studies are made in wind tunnels, in which extremely high-speed currents of air are blown against stationary models. But a shell can serve as an extremely high-speed model, hurtling through the stationary air.

GENERAL SCIENCE

Air Disarmament Today Would Not Hit Peacetime Plane Use

British Air Ministry's Research Director Says Previous Obstacle Has Been Eliminated by Progress

War stopped the B. A. A. S. meeting at Dundee after three days of sessions. All papers were made public as though actually read.

EFFECTIVE air disarmament is possible today without interfering with the peacetime development or use of the airplane, the British Air Ministry's research director told scientists meeting in Dundee, Scotland.

A previous technical stumbling block to abolition of the bomber has been eliminated by the last ten years of aviation progress, H. E. Wimperis said before the British Association for the Advancement of Science.

Ten years ago military and civil planes were so nearly alike, commercial craft could be easily converted into bombers so that any international limitation of bombers alone meant little.

Now, however, he asserted, as England wrestled with a diplomatic crisis which may end in air raids over her chief cities, commercial planes are so much slower than military ships that the commercial planes cannot be used in war. A limit on bombers alone, therefore, could be made to stick.

"The speeds of military aircraft are now in excess of 400 miles an hour and will rise still higher. But civil aircraft rarely go faster than 250, and it is doubtful whether it is economically advantageous to have even so high a speed as that," Mr. Wimperis, who is president of the association's engineering section and is a former president of the Royal Aeronautical Society, pointed out.

"Again, the comfort and space needed

for civil transport tends to produce a design of body which does not in the least resemble military requirements."

Only bombers need to be limited or abolished, he continued. Fighters are useless as bombers. "It cannot worry any peace-loving country, if one of its neighbors builds 1,000 or 10,000 interceptor fighters, any more than it would if that neighbor built immense numbers of anti-aircraft guns and searchlights.

"It would be but cautious to agree on a limit to the speed of civil types, but as this would merely confirm what economic requirements would themselves suggest, it need be no hardship."

Tomorrow's largest airplane, very likely a flying boat, will weigh about 250 tons as compared with today's biggest, the 41-ton Boeing-type Atlantic Clippers, Mr. Wimperis predicted. It will be powered with a dozen 3,000 horsepower engines. The largest power plant now in existence is an American 24-cylinder engine of about 2,400 horsepower.

Shells Aid Airplane Study

SCREAMING shells from field artillery are to be photographed as they tear through the air as an aid in research that will produce the super-speed bombing and fighting planes of the future, according to plans announced by Dr. J. W. MacColl of the British Ordnance Commission, with headquarters at Woolwich Arsenal.

The photographs of course cannot be made under ordinary field conditions. They will be "posed" pictures, with the

May Near Sound's Speed

FLIGHT approaching the velocity of sound, which is about 725 miles an hour, is a possibility, though its actual attainment will be difficult and exceedingly expensive in terms of engine power, C. N. H. Lock of the National Physical Laboratory at Teddington, near London, told fellow-physicists at the meeting.

In the Teddington laboratories, air speeds nine-tenths the velocity of sound, or about 1,000 feet a second, have been achieved in a small wind tunnel only a foot in diameter. A second, somewhat larger tunnel is now under construction. It will have glass windows in the side, so that the behavior of wing models under this high wind speed can be photographically recorded.

Grass Important Food

WITH war a reality, food will figure as importantly as munitions, and there will be a corresponding temptation to plow up Britain's long-established grasslands to plant grain and other "quick" food crops. How to keep the protecting grass and yet get fullest food value out of it, via milk and meat, was discussed in a special session of the B. A. A. S.

A new method of handling grass, that has been gaining favor in Britain, is to cut it at a younger stage than is customary for hay and dry it rapidly with artificial heat. The physiological and economic advantages of this method were set forth by Dr. S. J. Watson of the Jealott Hill Agricultural Research Sta-

tion in Berkshire and by E. J. Roberts of the University of North Wales.

As contrasted with ordinary hay, dried grass keeps a higher protein content and preserves far more of the important coloring-matter carotene, which is converted into growth-promoting vitamin A in the bodies of animals.

Questions "Racial" Limits

SORTING truth from falsehood in nations' claims that their boundaries should coincide with the boundaries of their constituent "races" is a prime duty of those scientists who make a special study of man as a physical being, urged Prof. W. E. Le Gros Clark of Oxford University, president of the B. A. A. S. section on anthropology.

Most anthropologists will agree, he said, that nations of the political world today are a fusion of races kept together, not because of blood relationship, but because of common language, customs, traditions and education.

Advising anthropologists to come out of the "museum stage" of their work, Prof. Clark predicted that the science of man will in future deal less with fossil bones of man's prehistoric ancestors and more with social problems facing the world right now. Emphasizing the lack of evidence which would show conclusively the role of physique and racial type in such important matters as under-nourishment, susceptibility to infections, tendencies toward crime, Prof. Clark declared that "it is remarkable that we still lack this essential knowledge."

Would Teach Sign Language

IN CONTRAST to present separatist nationalistic trends in Europe a proposal was advanced that every child in every country should be taught in play to "talk" the same sign language. This would provide a universal language to enable people of different languages to communicate, declared the sponsor of the plan, Sir Richard Paget, Bart.

Sir Richard, noted for his investigations as to the origin of human speech, described the systematic sign language which he and associates have devised. Denouncing the sign language used in church services for the deaf as "unsystematic and difficult for normal people to learn," Sir Richard said that the new sign language can be easily learned by the parents and family of a deaf child. By approaching the problem of language with these signs, he explained, "the mind of the deaf child would develop nor-

mally and he could then readily be taught to read and speak."

Alcohol Replaces Morphine

ALCOHOL injected into the sheaths of nerves that convey sensations of intense pain in advanced cancer cases does the work hitherto monopolized by morphine but without the latter drug's bad after-effects, it was reported by Dr. T. F. Todd of Salford Royal Hospital.

The treatment is risky to use, Dr. Todd cautioned. An overdose of alcohol may injure the nerves severely, scar their roots and lead to paralysis. "In view of these effects the method should be restricted to hopeless cases such as patients suffering from cancer." In his own practice, Dr. Todd has used alcohol injections mainly for the relief of patients in advanced stages of uterine cancer. Usually full relief from pain, lasting for three or four months, has been obtained.

Peaceful World Pictured

ANDYLLIC, warless world, a world without battles because there were no men in it to fight them, was depicted by the British Association president, Sir Albert C. Seward, F. R. S., emeritus professor of botany at Cambridge University.

Forgetting for an hour the menace that lay behind the rolling clouds over the North Sea, his audience heard him tell of a quiet landscape of strange beauty, that stretched from what is now Scotland to the coast of Alaska, almost halfway around the circumpolar world. Known to geologists as the Continent of Thule, it bore a population of trees and lesser plants whose nearest living relatives are found in China and Japan, California and the eastern United States.

A key to the botany of Thule was discovered in fossil beds on the Isle of Mull, off the western coast of Scotland. The rocks of Mull were formed in part by a series of great lava flows, with long periods of quiet in between. In the quiet intervals, soil formed on the lava surfaces and forests grew up in the soil. In them were such trees as plane or sycamore, magnolia, sequoia, ginkgo and the cryptomeria, famous in Japanese temple grounds.

"Lebensraum" Fanciful

GERMANY'S "Lebensraum" (room for living) claims were termed "fanciful." The speaker, A. Stevens, lec-

turer in geography at the University of Glasgow, denied the urgency of any problem of more living-space for the Reich, pointing out that while parts of Germany are as densely populated as Great Britain, there are still stretches of territory offering sufficient elbow-room, especially in the more recently settled eastern portions of the empire.

The question becomes one of national psychology, or at least of ruler-psychology, Mr. Stevens indicated: "Germany is sensitive to, if not conscious of, the disproportion between the power to organize and rule and the space to be organized and kept in order . . . She could not contemplate the possibility of herself having lost the United States as we did. Were her colonies not 'stolen' at Versailles, while her acquisitions from Denmark and Poland were legitimate conquests? . . . The tenacity with which a view is held is often in direct proportion to its absurdity."

Germany has been led into her fatal career of conquest partly through her combination of technological skill and financing, Mr. Stevens pointed out: "There is a part of Germany called the Bay of Leipzig, once a region of corn and beer, now the land of lignite. Here coal tar is abundant and electricity is cheap. Self-sufficiency is a means of security, and self-sufficiency calls for the substitute, the Ersatz.

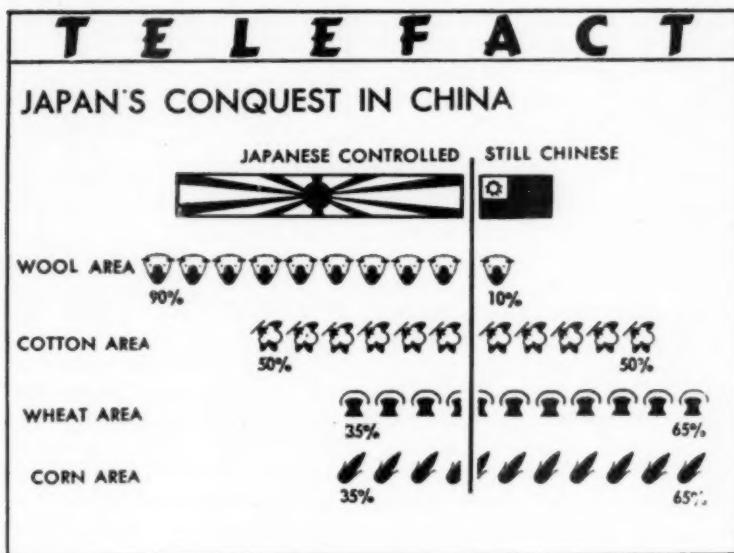
"We may indicate the function of this region in modern Germany by dubbing it Ersatia. The Ruhr is threatened by the French, Upper Silesia by Poland, and both are conveniently marginal. Does Germany see in Ersatia the heart whose beating must be her life in any future struggle? . . . There is money in Ersatz, especially in war: the industrialists are interested: the step is practical politics."

In the course of his address on natural geographical regions, Mr. Stevens contrasted the politico-military difficulties that have resulted from their development along jarring nationalistic lines in Europe with the freedom from friction that obtains within the wide boundaries of the United States.

"The proper scale of organization," he said, "is no longer represented by the European nation-states but rather by the United States."

Civilization in Africa

AFRICA, like Europe and Asia, has through the ages been the scene of ebb and flow of peoples, and the rise and fall of cultures, Prof. Raymond A. Dart of Witwatersrand (*Turn to page 172*)



GENERAL SCIENCE

War Brings a Multitude Of Incidental Problems

Physicians and Surgeons Must Learn to Work Under New Difficulties; Nutrition Problems Mount

MEDICAL aspects of war: Doctors in England, Switzerland, and elsewhere are practicing performing operations while encased in gas masks in addition to their other paraphernalia. The war-time surgeon should learn to carry out his duties in a gas mask, is the warning, just as a machine gunner learns to do so. Happy thought—the patient being given gas-and-oxygen anesthesia will be easily protected; his face is covered and any air given can be passed through the canister of respirator.

Deep pits were being dug for precious (and deadly) radium where it will be buried at the first danger of aerial bombardment. One direct hit would scatter the precious stuff so diffusely that it would be dangerous for human beings to live there for thousands of years to come. Such civilized luxuries as cancer treatments would become superfluous anyway in case of aerial attack.

Thousands upon thousands of men and women are having their blood typed in England, so that when bombs smash arteries and veins they can act as blood donors.

WITH food ration cards in effect for Germans, limiting rigorously the amounts of meat, sugar, marmalade, cereals, coffee, milk and cheese, oil or fats that can be bought, nutrition experts throughout the world are probably figuring out calories, vitamins, etc., to see how the Germans will fare.

U. S. Department of Agriculture experts, in our depression years, to help those on relief or those who face poor nutrition through not knowing what to eat, have figured out diets to fit the family income.

Very similar are the quantities allowed the Germans and in the U. S. A. "restricted diet for emergency use" when comparison is made on basis of articles rationed in Germany. The U. S. A. emergency diet goes lighter on meat and heavier on cereals. It does contain an egg every other day. This lowest level diet is intended for emergency use only, because it is deficient in protective foods—milk, eggs, tomatoes, green vegetables, etc. The U. S. D. A. also has a minimum-cost adequate diet that contains as much meat, double the milk, four times the cereal, as the Nazi rations. The specified food on the German ration card to-

tal about 7500 calories per week; not nearly enough because 2000-2500 calories are needed daily. But the restricted foods would be supplemented by other unrestricted foods, vegetables, potatoes, etc. The Germans won't get fat, but they will live.

PAWNS in the European game of human checkers are the peasants—millions of them in many countries. The League of Nations, not so successful in solving political problems, digs out information, facts, about what the farmers, rural workers, peasants eat.

The main characteristic of rural diets is monotony. The peasant obtains the energy he requires from cereals because he wants to get it at the cheapest price. Often grains provide 80% to 90% of the calories. Consumption of protective foods—milk, fruit, green vegetables, eggs, meat—is markedly deficient, especially in winter.

Peasants sell their produce, often consume absolutely none of it themselves as when Danish farmers sell all their butter and eat margarine. Reminiscent of stories from certain sections of the U. S. A.

TWO agricultural inventions, barbed wire and tanks which are tractors under their armor skin, are of prime importance in war. Miles upon miles of the spiky wire hedges are in European frontiers today.

Barbed wire is a U. S. A. invention, in 1874, created to keep cattle at home. Now about 200,000 tons are produced a year, about seven miles to the ton.

Tanks evolved from tractors during the World War. Since then tractors and trucks have mechanized armies putting artillery and cavalry horses out of jobs just as do tractors on the farms. Showing how one invention stalemates another—tanks are the one good weapon for smashing down barbed wire entanglements so infantry can get through.

FARTHEST BROUGHT of overseas resources cut off from Germany by war is whale oil from the Antarctic, an important industrial lubricant and soap material, particularly in textile manufacturing. Germany has also been using it, after a taste-removing refining process, as a food oil.

At present Germany probably has on hand a reserve of about 150,000 metric tons, less than a year's supply, according to Dr. Remington Kellogg of the U. S. National Museum, who represents American interests (*Turn to page 170*)

MATHEMATICS

Hitler Deserves Credit For New Abstract Journal

AMERICA is to furnish the world with a new international mathematical abstracting journal, *Mathematical Reviews*, to be born late this year or early next. Credit Herr Hitler and his Nazi ideas for this new venture, for there was in Germany a satisfactory abstract journal telling the mathematical world who had published what and where. But like all things German it was purified "racially." Foreign editors were dropped. Its internationalism sheared off. Taking easy access to literature away from a mathematician is like stealing a carpenter's hammer. So the godmothers of research, Carnegie Corporation and Rockefeller Foundation, hover over the new journal financially. The American Mathematical Society is managing things, the Mathematical Association of America assisting.

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PSYCHOLOGY

Single Punishment Changes All Later Behavior

PUNISHMENT does work.

Fresh evidence that the discredited spanking may be extremely effective for education is provided by rat experiments just reported by Dr. Warner Brown, of the University of California in the *Journal of Comparative Psychology*.

Rats were trained by Dr. Brown to turn in a food box so as to take the shorter of two paths, both leading to food. Invariably these trained rats took the quickest road to reward.

They had learned in the slow patient way of repeated experiences how to get pay with the least possible expenditure of effort.

But one punishment in this "short" food box changed their whole behavior. Instead of dashing at full speed down the short road and under the curtain that hid the boxes from sight, these punished rats became hesitant. Some vacillated between the long and the short paths. Nearly all those taking the short path paused timidly at the curtain. Some turned back there—almost at their goal.

At the "short" food box itself, suspicion and hesitation were marked. Necks were stretched out while the body was held back. Some turned back even there, going all the way to the "long" box where punishment had never been.

They had learned in one lesson.

Suspecting that possibly failure to receive food on the occasion of the punishment might be a factor in teaching the rats that their favorite "restaurant" had failed them, Dr. Brown had taken the precaution of first allowing the rats to be disappointed by failure to receive food. Unpunished, these rats continued to run to the short box. Later, punished, they hesitated or deserted it.

Punishment itself, Dr. Brown concludes, quite apart from failure to receive reward, has a positive and potent effect in altering all later behavior.

Thus Dr. Brown's findings discourage any tendency of psychologists to minimize the effects of punishment on the child.

But when psychiatrists deplore severe punishment, it is not because they believe it ineffectual. Like the psychologist, they have found that a single shock may change the whole life of the child.

Science News Letter, September 9, 1939

ASTRONOMY

Faint Dwarf Stars Fringe Great Galaxies of Stars

EVIDENCE that a typical disk-shaped island universe in far-off space probably has a preponderance of very faint dwarf stars at its fringes was presented to a special summer conference on astronomy at the Harvard Observatory.

The evidence results from measurements of the rotation of these nebulae made by Milton L. Humason at Mount Wilson Observatory which has been interpreted by Dr. Jan H. Oort, co-author of the Oort-Lindblad theory of galactic rotation which first gave astronomers definite proof that our own Milky Way galaxy turns in space like a giant-cart-wheel.

He is now studying the more regular of the outside nebulae in an effort to learn about their structure and, if possible, the history and methods of their evolution. Later he will study the great swastika-shaped spiral nebulae which are believed to be similar to our own galaxy in an effort to learn facts concerning it which cannot be detected from our own position in one of them.

Preliminary results indicate that the light emanating from these nebulae is particularly intense at the center but that the mass is fairly evenly distributed. Dr. Oort has interpreted this as suggesting that the fringes of the system abound in very faint dwarf stars, or great amounts of gas, of considerable mass but low luminosity.

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IN SCIENCE

GENERAL SCIENCE

Uncle Sam Is Storing Up Strategic Materials Stocks

QUIET the most self-contained nation on the earth, the United States is now storing up against an emergency the most essential of the "strategic" materials that would soon become scarce if we engage in war or war elsewhere in the world cuts us off from needed supplies.

Strategic materials are those, essential to national defense, that we would have to get outside continental U.S.A. in time of war. In the first days of an emergency, Uncle Sam would step in promptly to control and distribute them. They are:

Aluminum, antimony, chromium, coconut shell char, manganese of ferro-grade, manila fiber, mica, nickel, optical glass, quartz crystal, quicksilver, quinine, rubber, silk, tin, tungsten, wool.

The government is now engaged in laying up what supplies it can of some of these materials, using \$10,000,000 chiseled down from an authorized \$100,000,000, made available in the closing weeks of the recent Congress. To buy all the stocks that might be considered desirable would cost about a billion dollars, it has been estimated.

Rubber is being obtained from Britain by swapping cotton for it, which saves a lot of cash expenditure.

Tin, and the metals used in tool steels, chromium, manganese, tungsten, are undoubtedly among the ones to be bought first.

While the monopoly metals, aluminum and nickel, are very necessary, commercial stocks are large in the case of aluminum and there is plenty of nickel just across the border in Canada.

Some of the "critical" materials, less seriously needed in an emergency, may also be purchased for stock-pile storing. This list includes: asbestos, cadmium, coffee, cork, cryolite, flaxseed, fluor spar, graphite, hides, iodine, kapok, nux vomica, opium, phenol, picric acid, platinum, scientific glass, tanning materials, titanium, toluol and vanadium.

Artificial substitutes, such as nylon and vinyon, for silk, and synthetic wool from milk's casein promise to help out greatly.

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SCIENCE FIELDS

ARCHAEOLOGY

Gold Mask Portrays Royal Bible Villain

See Front Cover

MEET—on the front cover of this week's SCIENCE NEWS LETTER—a royal villain of the Bible—Pharaoh Shishak the First, who plundered Solomon's Temple in Jerusalem, carrying off to Egypt a rich haul of silver and gold. This gold mask of the King, and the coffins of silver and gold which provided him with a glittering burial, may reveal at last some of the lost Jewish religious treasures, melted and reshaped. Shishak's tomb was recently entered and pronounced undisturbed, by Prof. Pierre Montet of the University of Strasbourg.

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PSYCHOLOGY

Leadership Is Often Born Of Resentment of Authority

IN DEMOCRACY as well as in Reich, in the scientific world as well as in politics, men want and need leaders.

Yet most leaders are self-appointed. Their rise grows out of the compelling demands of their own personality rather than from any clamor of the populace.

Those resistless forces that put men above their fellows are analyzed by Lawrence K. Frank, of the Josiah Macy, Jr., Foundation for the scientific journal *Psychiatry*.

Leaders are of two types, Mr. Frank found. First there is the aggressive type who constantly strives to attract a following whose personalities he exploits. Coming from homes where discipline was strict and initiative and originality sternly suppressed, such persons develop leadership to express resentment of authority. Yet, once in power, they perpetuate the circle of overbearing authority and suppression of initiative.

"The universities and research institutes are everywhere caught in this personality difficulty," said Mr. Frank, "as distinguished men of science and the professions stand astride the road to new knowledge and improved methods, blocking, diverting and sometimes sabotaging the work that threatens to go be-

yond their own personal reach and convictions."

"The pronouncements of many of the authoritative states," he declared, "are no more absolutist and dictatorial than what many scientific and professional 'leaders' say or would like to say."

"The difference is in the permission still available here to reject these pronouncements if the rebel will take the risks involved of scientific or professional ruin."

But to another type of leader, authority and the accepted is neither to be resented nor worshipped but merely marks for him the frontier beyond which his own work must begin.

Such a leader, said Mr. Frank, "who does not need to destroy other persons or their ideas because his drive is to go beyond the accepted and familiar in creative endeavor, can achieve and then tolerate and even encourage successors who will explore ahead and often render his own work obsolete."

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GEOLOGY

No Heavenly Metal in Arizona's Meteor Crater

THREE'S no metal from heaven in evidence inside the huge meteor crater in Arizona. All metal must have spattered outside when the meteorite crashed to earth, says Samuel G. Gordon, Philadelphia Academy of Natural Sciences geologist, just back from an expedition to study America's biggest "shellhole."

About 15 tons of fragments of the meteor, ranging from a few ounces in size to half a ton, have been found in a radius of several miles. Mr. Gordon found that the crater itself, several hundred feet deep, is filled with about 80 feet of sediment. Shells of existing types of water creatures in the sediment indicate that the meteor struck thousands of years ago, when the region was less dry.

Mr. Gordon displayed a hammer head which he forged from meteoric fragments. So tough are nickel-iron alloys of celestial "iron," Mr. Gordon says, that metallurgists got their idea for formulas in battleship armor plate from meteoric material.

A Philadelphia mining company, which owns the meteor crater in Arizona, had hopes of finding tons of pure nickel-iron alloy, but the hole they bought has never disclosed in test drillings any sign of a buried metal mass.

Mr. Gordon will supervise the making of a scale model of the crater for the Academy's exhibitions.

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PHYSICS

Measure Vitamin B₁ By Color Intensity

A NEW method for gauging the quantity of vitamin B₁ in any given food sample is announced by Drs. Gilberto G. Villela and Aluisio M. Leal of the Oswaldo Cruz Institute, Rio de Janeiro, Brazil. (*Science*, Aug. 25)

A water extract is made of the food to be analyzed. The solution is acidified, and ammonium molybdate is added. In the presence of vitamin B₁ an intense blue color blazes up. Gauging the intensity of this color by means of a suitable instrument gives a measure of the quantity of the vitamin present.

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PALEONTOLOGY

Rare Fossil Bird Tracks Just Beyond Museum's Grasp

THE AMERICAN Museum of Natural History is anxious for a group of rare and valuable 25,000,000-year-old bird tracks just beyond reach, as famous Tantalus of ancient Greek mythology thirsted once after a bunch of elusive grapes.

The Museum cannot afford to build scaffolding to reach up, or block and tackle to reach down, to a deposit of tracks found exposed two-thirds the way up a Slim Buttes, S. D., badlands cliff, and the tracks cannot be reached in any other way, Dr. Walter Granger, curator of paleontology, said.

A sample of what is in store for the Museum and its visitors was placed on exhibition. About 100 footprints made by wading birds on the shores of lakes that vanished ages ago are included in specimens picked up at the foot of the cliff by Henry Lee of Rapid City, S. D. They had dropped from a stratum above. Mr. Lee saw more in the stratum. It is these the Museum wants.

"There is nothing much we can do about it except to wait until Mother Nature at her leisure undermines more of the stratum and drops additional blocks to the foot of the cliff for man to discover and that may be a matter of many, many years," Dr. Granger lamented.

"Tracks of dinosaurs left in sandstone and shale are common enough and the tracks of extinct mammals are also found occasionally, but bird tracks preserved in the rocks are rarer than the proverbial hens' teeth."

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AERONAUTICS

War May Answer Question Can Airplane Win War?

Airmen Who Support View of Plane's Supremacy Base Opinion on Theory of the "Lightning Attack"

EUROPE'S war is expected by authorities to answer the biggest question in military science today:

Can the airplane win a war?

Air enthusiasts, whose loyal support is in no small part responsible for aviation's enormous strides, insist that it can. Orthodox military experts contend that the airplane has never settled a conflict and will not settle the next one. No new weapon, they claim, whether it be David's sling or "flying fortress," has ever revolutionized warfare.

Three sanguinary wars have been fought in the last four years, with one of them still going on. The airplane did not win by destroying cities in Ethiopia because there were no cities to bomb. Artillery and not the airplane was the major factor in General Franco's triumph in Spain. Japan has had overwhelming air superiority in her invasion of China, but the war has not been won yet and may never be. None of the three wars is conclusive either way, in expert opinion.

Not all air-men support the view of the plane's surpassing power, but those who do base their opinion on the theory of the "lightning war," by which a nation is brought to its knees in a short time by the destruction of its cities, industries and key centers by continuing waves of bombing planes. They claim the bomber will always get through and that there is no defense against its deadly thrusts. Anti-aircraft artillery is ineffective, they assert: interceptor fighters cannot be warned in time to head the invaders off.

Orthodox military experts tend to minimize the damage which airplanes can do to cities. It seems apparent that they cannot turn them into mere rubble piles. But damage that extensive may not be necessary. On March 16-18, 1938, the city of Barcelona was subjected to frequently repeated waves of attacks by Italian planes from Majorca. The city was quite demoralized.

Airplanes cannot capture ground, it is also pointed out; only infantry can do that and in classical military theory, a

prerequisite of victory is capturing ground. The air enthusiasts say this theory nay. Orthodox military experts also tend to insist that destructive effects of gas, incendiary and shattering bombs are exaggerated.

Hence, general staffs of ground forces believe generally that the airplane's greatest usefulness is in spotting the enemy for guiding artillery fire and in bombing specific military objectives. They see for the plane an auxiliary role rather than a dominating one.

Casualty rates for planes, according to most estimates, will range between 25% and 100% in the war just begun. Casualty rates for pilots will be nearly as high. This means that the complete air force will have to be replaced several times a year. The effort to do so will be too great and air war will in time be cut down to its proper size, it is further argued by the more conservative military men.

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in the international whaling conferences.

Germany has a fleet of five whaling vessels, with a total gross tonnage of approximately 70,000. Individual ships range in size from about 8,000 to 20,000 gross tons. In addition, two Norwegian whaling ships are under charter.

This fleet is in no danger of capture or destruction at the hands of British cruisers, for it is all safely tied up in Hamburg harbor. The Antarctic whaling season does not begin until early in October, so that even if conditions in Europe were normal the ships would not be due to sail south for another week or so.

Most of the world's whaling is done by the Norwegians. Conceivably, a blockaded Germany might get some whale oil from Norway by more or less round-about means. However, the greatly stepped-up wartime demands in Britain and France, not to mention the United States and other neutral industrial countries, will compete heavily for Norwegian oil—and these nations will have the very

considerable advantage of being able to offer the Norse whalers real money for their wares.

TO KEEP our orientation in a war-like world: Guns can be very, very useful to science and industry.

There is the deep-sea gun which shoots samples out of the bottom of the ocean to find radium perhaps but, more important by far, to determine the constitution of seven-tenths of the earth's crust—that land that lies beneath water about which we are abysmally ignorant.

There is the gun that shoots holes in the casings of oil wells being drilled thousands of feet in the ground when it is desired to tap the liquid gold that is petroleum.

And the gun that shoots open a clogged blast furnace outlet plugged with frozen slag.

And the gun that shoots aloft distress signals from ships in distress or the gun that flings the first rescuing line to wrecked ships.

UNCLE SAM'S little colonies in Antarctic, to be established this winter, may prove to be the safest place on earth. Greatest danger may be that in the excitement of a smashing civilization ships to bring them back to a battered world may forget to call.

BOMBS and poison gas may play important roles in the war. For background on European war developments involving bombs see SNL, March 25, 1939. For a list and descriptions of the principal war gases, see SNL, Jan. 28, 1939.

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STATISTICS

Fewer Catastrophic Deaths This Year Than in Last

DESPITE the tornadoes, fires, mine explosions, floods, and railroad accidents we've been reading about, statisticians are pleased that the first half of 1939 has fewer catastrophic deaths than the same period last year. The U. S. A. record as compiled by the Metropolitan Life Insurance Company from the daily press for the first six months of 1939 is 29 accidents killing 5 or more. The total loss of life was 266. For the first six months of 1938, 57 major accidents killing 771.

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Rubber trees are no more limber than the average tree.

BOOKS ON WAR!

The librarian of Science Service has prepared this list of timely pertinent books giving the background of the swiftly-moving European events.

If War Comes — R. Ernest Dupuy and George Fielding Eliot — *Macmillan*, 369 p., \$3.

Poland: Key to Europe — Raymond L. Buell — *Knopf*, 364 p., \$3. (Reprint)

Revolts and Dictatorships — Hans Kohn — *Harvard*, \$3.50.

Geographic Aspects of International Relations — Charles C. Colby, ed. — *Univ. of Chicago*, 296 p., \$3.

Revolt Against War — H. C. Engelbrecht — *Dodd, Mead*, 367 p., \$2.50.

When War Comes — Larry Nixon, ed. — *Greystone Press*, \$2.25.

The Ramparts We Watch — George Fielding Eliot — *Reynal and Hitchcock*, 370 p., \$3.

Bombs Bursting in Air — George Fielding Eliot — *Reynal and Hitchcock*, 173 p., \$1.75.

The War Gases: Chemistry and Analysis — Mario Sartori — *Van Nostrand*, 360 p., \$7.50.

Breathe Freely! The Truth about Poison Gas — James Kendall — *Appleton-Century*, 179 p., \$1.50.

Elements of Political Geography — Samuel Van Valkenburg — *Prentice-Hall*, 401 p., \$3.50.

Race: A History of Modern Ethnic Theories — Louis L. Snyder — *Longmans, Green*, 342 p., \$3.

Fighting Planes of the World — E. C. Talbot-Booth, ed.; Eric Sargent, comp. — *Appleton-Century*, 607 p., \$3.

The Ships and Aircraft of the U. S. Fleet, 1939 — James C. Fahey, comp. — *Herald-Nathan Press*, 47 p., 50 c.

Air War — W. O'D. Pierce — *Modern Age Books*, 224 p., 50 c.

Mein Kampf — Adolf Hitler — *Stackpole Sons*, 669 p., \$3. (Unexpurgated edition)

Nazism: An Assault on Civilization — Pierre Van Paassen and James W. Wise, eds. — *Smith and Haas*, \$2.50.

Inside Europe — John Gunther — *Harper*, 531 p., \$3.50.

Ordeal (A Novel) — Nevil Shute — *William Morrow*, 280 p., \$2.50.

Days of Our Years — Pierre Van Paassen — *Hillman-Curl*, \$3.50.

Reaching for the Stars — Nora Waln — *Little Brown*, \$3.

ANTHROPOLOGY

Charge School Texts Teach Misleading Nazi Doctrines

Committee Headed by Columbia University Anthropologist Finds Widely Used Books Contain Unscientific Material

WIDESPREAD incorrect teaching regarding the meaning of "race" exists in 66% of 166 textbooks used in typical American schools, the American Committee for Democracy and Intellectual Freedom charged in announcing a broad educational campaign against unscientific teaching of race problems in American schools.

One-fifth of the texts teach what amounts to Nazi doctrine about superior and inferior races, Prof. Franz Boas, Columbia University anthropologist and committee chairman, declared, in announcing the findings of a panel of experts who examined schoolbooks used in Texas, Virginia, St. Louis, Boston and New York City.

Two out of every three texts use the word "race" where "nationality" or "people" is meant.

"The myth of the 100% Aryan and similar nonsense has reached such proportions, even in our own country," Prof. Boas said, "that the fight against race prejudice is now a major problem of educators.

"We can go a long way towards destroying the effectiveness of demagogues like Father Coughlin or General Moseley if we conquer the widespread ignorance which exists on matters of race."

Teachers, school officials and publishers are being asked to support this campaign for revision of all textbooks dealing with race questions. Texts charged with giving false ideas about race are largely in the field of geography and history, with civics, biology, general science, sociology and economics books also listed.

The percentages of texts found misusing "race" in the various localities were: Texas, 62.5%; Virginia, 71.4%; St. Louis, 50%; Boston, 68.2%; New York City, 78.2%.

The following statement adopted by the American Anthropological Association a few months ago is cited as a reliable scientific statement on race:

"Race involves the inheritance of similar physical variations by large groups of mankind, but its psychological and cul-

tural connotations, if they exist, have not been ascertained by science.

"The terms 'Aryan' and 'Semitic' have no racial significance whatsoever. They simply denote linguistic families.

"Anthropology provides no scientific basis for discrimination against any people on the ground of racial inferiority, religious affiliation, or linguistic heritage."

Some of the examples of misuse of "race" in texts cited include:

"It is very plain that each race thinks very differently from all other races. That is why the Eastern (Oriental) and the Western (Occidental) peoples find it difficult to understand each other." — George C. Wood and Harry A. Carpenter, *Our Environment: The Living Things in It* (1938, p. 125).

"The world population falls into races having certain inherited traits of body and mind." — Hutton Webster, *Early European Civilization* (1933, p. 21).

"The really important matter is one about which there need be little dispute—the fact of racial differences. It is the practical question of differences—the fundamental differences of physical appearance, of mental habit and thought . . ." — R. E. Park and E. W. Burgess, *Introduction to the Science of Sociology* (1928, pp. 635-36).

"Some races of people are more inclined to do certain things than other races. The French are noted for artistic goods . . ." — F. K. Branom and H. M. Ganey, *Our World* (1931, p. 179).

"The economic aspect of the Negro problem today arises largely from the ignorance and economic weakness of the Negroes—This state of affairs is due in some degree to the economic inertia and certain racial traits of the Negroes themselves." — Richard T. Ely and Ralph H. Hess, *Outlines of Economics* (1937, pp. 57-8).

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School children in the Virgin Islands are taught to make their own individual drinking cups of seed pods decorated with a personal design.

ENGINEERING

Henry Ford Gets Patent For Improved Type Of "Liners"

New Inner Surfaces for Motor Cylinders Can Be Removed With a Screw Driver; Of Thinner Stock

HENRY FORD has been granted a patent (No. 2,170,015) by the U. S. Patent Office for an improved easily removable "liner" for automobile cylinders. Liners are the hardened inner surfaces of cylinders in which the pistons move and which serve to conduct the excess heat of the explosion of fuel to the engine block.

The new Ford liners can be removed with a screw-driver, in contrast to the powerful presses formerly employed to free them from the engine block. They are also made of thinner stock and thus have better heat conductivity, states the patent.

Liners in the past, Mr. Ford indicates, have been made of special steel tubing either pressed or screwed into the cylinder bore. The latter method is most expensive and but little used in medium priced motor cars.

Inserting a tubular liner has been accomplished by "freezing" it to the temperature of liquid air (thus making it contract) and then placing it in the cylinder bore where it expanded to give a tight fit.

Getting the lining out for replacement was something else, however, and powerful presses have been employed. Even then the lining was apt to break, jam within the cylinder and score it.

Ford's new linings are made of flat thin sheet steel of 20 to 22 gauge curved into a cylindrical shape. Beveled edges on the ends of the sheet meet to form a groove. Spot welding of this groove is made at three points, near each end and in the middle.

The embryo liners are then heat treated, made to absorb considerable amounts of carbon on their surface which—on cooling—gives a hardened surface comparable with that of expensive alloy steels.

The liners are next placed in the cylinder bore by the chilling, liquid air method. The trick of getting them out is accomplished by merely putting a small screw-driver down the groove and breaking the tiny weld. Next the middle weld is ruptured and finally the third.

Then you reach in and lift out the liner.

Cheap replacement for what has previously been a costly difficult operation is one claim of the patent. Others are less costly initial materials and better heat conductivity of the finished liners.

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University told anthropologists attending the meeting. Ruins at Mapungubwe in South Africa, he said, show that a high culture existed in this part of the world in late Stone Age times, before the coming of the Bantu-speaking Negroes who now dominate most of the continent.

Skeletons associated with the Mapungubwe finds indicate that this ancient civilization was the work of a race intermediate between (and possibly a hybrid of) the Cro-Magnon and Neanderthal types, which are quite distinct in Europe.

An effort to unscramble the puzzling near-human ape remains found in South Africa was made by Dr. Robert Broom of the Transvaal Museum, Pretoria. Perhaps the best known of these are the Australopithecus skulls, which are quite definitely ape-like, except that their teeth are much more like those of man than they are like the teeth of gorilla or chimpanzee. Dr. Broom regards Australopithecus not as ancestral to man (he came too late in time for that) but as a survivor of a possible ape-like ancestral stock that existed before Ice Age times.

Moroccan Doctors' Secrets

EXHIBITING to the anthropologists 65 native Moroccan charms and sickness remedies, Walter Fogg of the University of Wales told of overcoming Moslem doctors' aversion to revealing their secrets, and reported that the majority of the 65 items deal definitely with witchcraft and evil spirits. Prescriptions in Morocco include wearing a piece of camel's windpipe for hiccups, and wearing the body of a holy bird, the hoopoe, as "a charm against almost anything."

Even British botanical laboratories at Kew have been unable to determine all plant ingredients in some of the mixtures, Mr. Fogg reported. Some of the remedies come from ancient Egyptians and Greeks.

Life Largely Surfaces

SKIN-DEEP is not merely beauty, but life itself, it was suggested in the address of Prof. Eric K. Rideal, of Cambridge University, president of the B. A. A. S. chemical section. The thinnest of skins hold the secret of life—layers only one molecule deep, at the interfaces where two cell-constituents meet, for example, a fatty substance in contact with a watery solution.

The very shape and arrangement of the molecules in these thin layers are of vital importance, Prof. Rideal explained. The larger molecules, especially those of the proteins, are long affairs, with definite "head" and "tail" ends, bearing opposite electrical charges. Their arrangement in the surface films determines the way in which they absorb food substances, resist or succumb to poisons, permit wastes to leave the cell, etc.

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ASTRONOMY

Omicron Andromedae Varies More Than Half Magnitude

ATEST fickleness in the heavens: The relatively bright star, Omicron Andromedae, visible with naked eye, varies more than half a magnitude from its third magnitude brilliance. Evidence found by Dr. Richard M. Emberson in observations made with a thermoelectric photometer attached to a Harvard telescope at Oak Ridge, Mass. Astronomers will conduct an investigation into the cause of this new-found variability. The larger the figure for the magnitude of a star the fainter the star. Stars more than sixth magnitude are invisible to the unaided eye; often it is hard to see the fifth and sixth magnitudes.

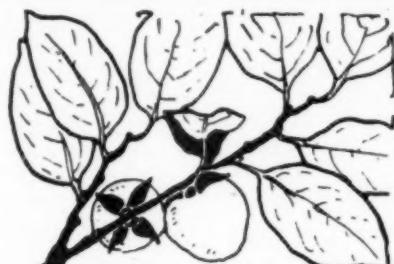
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● R A D I O

Dr. F. Alton Wade, geologist and senior field scientist of the U. S. Antarctic expedition, will be the guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Monday, September 18, 4:30 p.m., EDST, 3:30 EST, 2:30 CST, 1:30 MST, 12:30 PST. Listen in on your local station. Listen in each Monday.

PLANT PATHOLOGY

NATURE RAMBLINGS
by Frank Thone



Spreading Menace

PERSIMMON wilt, new and deadly enemy of persimmon trees, has crossed the Mississippi. It has been found as far west as Oklahoma, by Drs. K. Starr Chester and W. W. Ray of Oklahoma A. and M. College.

Persimmon trees have a threefold importance: their wood is ideal for golf club heads and similar small objects, their fruit is one of the most important wildlife foods, and their tough, ropelike roots made them favorites with soil conservation workers as plantings to check erosion.

The disease is caused by a fungus known as *Cephalosporium*. Its course is terribly rapid; trees usually die within a few weeks after they are attacked. There is no known cure or preventive. It is quite possible that all of America's persimmons may go to join the chestnut trees, wiped out by the chestnut blight several decades ago.

Persimmon wilt was first discovered in 1937, on a farm in Tennessee. Since then, infestations have been found widely spread in the Southeast, and now it is known to be invading the Southwest.

The big-fruited Japanese persimmon, raised for market in parts of the South, is resistant to the disease when grown on its own roots. However, many of the orchards are of trees grafted on American persimmon roots, and these trees are susceptible.

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Sea level along the Pacific coast varies a few inches with the seasons, being high in the winter at Seattle, for instance, and low in spring and summer.

Bronze hand mirrors used by Etruscan women of ancient Italy were engraved with pictures of Helen of Troy and other romantic characters.

BOTANY—GEOLOGY

Plants Used as Prospectors For New Mineral Wealth

THE PLANT MATERIAL IS REDUCED TO ASHES, THEN PLACED IN CARBON ARC AND ANALYZED WITH THE SPECTROGRAPH

BOTANY may presently come to the aid of geology in prospecting for mineral wealth, if a new method proposed by two Swedish scientists, Drs. Nils Brundin and Sven Palmquist, works out as well in the field as laboratory tests promise.

The Brundin-Palmquist method depends on the fact that all substances in the ground dissolve at least to a slight extent in soil water, and are taken up with the water by plant roots and concentrated in the leaves and young twigs.

In testing any given area for the possible presence of a sought-for mineral, leaves and twigs are collected from deep-rooted trees and shrubs and stored in numbered bags. Corresponding numbers are marked on a map.

In the laboratory the plant material is reduced to ash in an oven. Samples of the ash are placed in a carbon arc, and the light is broken up by the prisms of a spectrograph and recorded as lines on a photographic plate. The stronger and

more pronounced the lines indicating any given element, the more abundant that element was in the plant.

Obviously the method is not particularly well adapted to prospecting for such common metals as iron and aluminum, which are present in abundance in practically all soils, even though they may be in commercially useless compounds. However, it should prove especially valuable in the search for rarer metals like nickel and molybdenum, which are very "spottily" distributed and difficult to locate by methods now in use.

Naturally the new Swedish method would not be sufficient by itself to locate the ore-bearing bed of rock. This would not necessarily be directly beneath the indicator trees. Soil water, especially at deeper levels, has often traveled considerable distances. Where the botanist leaves off the geologist would have to start, endeavoring to trace to its source the water that brought the telltale traces of mineral elements to the trees.

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PHOTOGRAPHY

Robot Deep-Sea Camera Makes Photographs Two Miles Down

PHOTOGRAPHS two miles down in the ocean—deepest sea pictures ever taken—have been snapped in Bermuda waters by means of a massively built, automatically operating deep-sea camera outfit invented by Prof. E. Newton Harvey of Princeton University. Previous record for submarine photography was William Beebe's "shooting" from the bathysphere, about half a mile down, only a quarter of the new depth record.

Prof. Harvey's device has two windows of an extra-strong type of glass, to resist the tremendous pressure of two tons to the square inch encountered at two miles down. The camera looks out through one window, and through the other a beam of light is projected. A

timing device turns the electric lamp on and off at predetermined intervals, and a motor winds the camera film, which is of ordinary 16-millimeter size. Cur-

Books

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rent is supplied from two six-volt batteries.

A lure, in the shape of a wooden figure of a deep-sea fish, is suspended in front of the camera, to coax hungry deep-sea predators to attack it, and thus come within camera range.

Operation is entirely automatic, and the "shots" have to be made entirely by chance. If no subjects happen to be in front of the lens, of course a blank frame on the film results. However, it is possible to make so many exposures on a

reel of film that this is a matter of no great consequence.

Describing his apparatus (*Science*, Aug. 25), Prof. Harvey states that he sent it down for five descents in the deep water off Bermuda. The mechanism operated successfully, but got no pictures of any large fish or other marine animals. The only objects recorded were 17 small organisms of some kind that swam across the field during one of the runs, but they were not large enough to be identified.

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PUBLIC HEALTH

Size of Families a Factor Affecting TB Decline

A NEWLY discovered factor in the tuberculosis deathrate which has been continuing over a long period of years has been brought to light by Miss Jean Downes of the Milbank Memorial Fund. This factor, it appears, will in the future continue to play an increasingly important part in the continued decline in tuberculosis mortality.

The new factor Miss Downes has discovered has to do with the effect of tuberculosis on the size of the family unit. The family unit in her studies consisted of mother, father and children. When one of the parents had tuberculosis, the family had fewer children than non-tuberculous families did. The tuberculous family's size was further reduced by earlier deaths of its members.

This tendency of the tuberculous family to be eliminated more rapidly, through the combination of lower fertility and excessively high mortality of offspring, has contributed to the decline in the tuberculosis death rate, Miss Downes believes.

Since limitation of births among the tuberculous is now being encouraged as

a health measure for the tuberculous, Miss Downes says that if in the future there is no marked change in the hazard of death and disease to the offspring of the tuberculous, the size of the family unit among the tuberculous will play an increasingly important part in decline in mortality from this disease.

Her conclusions were drawn from a study of family histories in a rural area of Cattaraugus County, N. Y. She found about the same difference in average size of families between tuberculous and the group as a whole in both the nineteenth and twentieth centuries. Among families in which all children were born before 1901, for example, at the end of 25 years of married life 100 women in tuberculous families had borne on an average 481 children compared with an average of 526 children per 100 women in the general group of families. During the period from 1900 to 1929, after 16 years of married life 100 women in the tuberculous families had had on an average 261 children compared with 375 for the 100 unselected women.

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CHEMISTRY

Chemists to Honor Charles Goodyear

THE NATION'S chemists gathered in Boston on September 11 at the meeting of the American Chemical Society to honor the 100th anniversary of Charles Goodyear's discovery, in 1839, of the use of heat to vulcanize rubber. A special symposium served as a sounding board of discovery which harks back to Goodyear's success, a century ago, of turning sticky, tacky "India Rubber" into a tough, pliable and valuable article of commerce.

While chemistry played its role in the first fabrication of a useful rubber, Goodyear himself was the first to claim that his discovery was not the result of scientific investigation.

Said Goodyear, "While the inventor (Goodyear) admits that these discoveries were not the result of scientific chemical investigations, he is not willing to admit that they were the result of what is commonly termed accident; he claims them to be the result of the closest application and observation."

Much folklore surrounds Goodyear's discovery but the actual sequence of events was fairly simple. By using sulfur to take the stickiness off rubber articles the inventor interested the Post Office in ordering 150 mail pouches.

The bags were fabricated and seemed perfect. In a final test they were hung by their handles but soon were on the floor and others, not yet fallen, were in a sorry condition.

Suspecting heat might be the cause of the decomposition Goodyear experimented with sulfurized rubber. When touched to a red hot stove such rubber charred like leather instead of melting as would untreated rubber. From this Goodyear rightly inferred that if the charring could be stopped at the right point the whole mass of rubber would be "cured", remain elastic and not be sticky.

This idea he verified by discovering that rubber could not be melted in a bath of molten sulfur but only charred. Always, beneath the charred surface, he found a tiny layer where the rubber was perfectly cured. It was this significant finding, made just a 100 years ago, on which rests the great world-wide rubber industry of today.

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When laminated glass was first patented in England in 1885, the idea was not safety, but the decorative feature of colored glass between clear sheets.

First Glances at New Books

Engineering

THE STORY OF MAN'S QUEST FOR WATER—Jasper Owen Draffin—*Garrard Press*, 232 p., \$1.75. In most areas of the modern world water is no longer, like the air, free. And when you see the trouble, time and expense which man has spent and is spending to get good water you can realize the reason why. The author is professor of theoretical and applied mechanics at the University of Illinois.

Science News Letter, September 9, 1939

Physics

SUPERSONICS: The Science of Inaudible Sounds—Robert Williams Wood—*Brown Univ. Press*, 158 p., \$2. (Charles K. Colver lectures, 1937) These lectures for the layman give a simple, yet eloquent, story of the strange properties of those sounds we cannot hear.

Science News Letter, September 9, 1939

Biology

MOLLUSKS COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—Paul Bartsch and Harald Alfred Rehder—*Smithsonian Institution*, 18 p., 5 pl., 15c. A NEW HOLOTHURIAN OF THE GENUS THYONE COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—Elisabeth Deichmann—*Smithsonian Institution*, 7 p., 5c.

Science News Letter, September 9, 1939

Biology

MICROBIOLOGY IN THE PRESERVATION OF THE HEN'S EGG—R. B. Haines—*British Library of Information*, 65 p., 75c.

Science News Letter, September 9, 1939

Botany

FOREST AND FUNGUS SUCCESSION IN THE LOWER YUKON VALLEY—Dow V. Baxter and Frank H. Wadsworth—*Univ. of Michigan Press*, 52 p., 25c.

Science News Letter, September 9, 1939

Conservation

OUR NATURAL RESOURCES AND THEIR CONSERVATION (2d. rev. ed.)—A. E. Parkins and J. R. Whitaker—*Wiley*, 647 p., \$5.

Science News Letter, September 9, 1939

Ornithology

LIFE HISTORIES OF NORTH AMERICAN WOODPECKERS: Order Piciformes—Arthur Cleveland Bent—*Govt. Print. Off.*, 334 p., 39 pl., 50c. (U. S. National Museum Bulletin 174.)

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Biology

BIOLOGIE. Pt. 1—Richard Kuhn, Otto Warburg, D. Keilin, John H. Northrop,

F. C. Bawden, N. W. Pirie and D. M. Wrinch, 81 p., 25 fr.; Pt. 2—Joseph Needham, C. H. Waddington, Johannes Holtfreter, Jean Brachet, H. J. Muller, N. W. Timoféeff and J. B. S. Haldane, 111 p., 25 fr.—*Hermann et Cie., Paris*.

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Biology

RECHERCHES SUR QUELQUES PROBLÈMES DE LA CARYOCINÈSE DES ANGIOSPERMES—Yu Chi-Chen—*Hermann et Cie., Paris*, 94 p., 20 fr.

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Horticulture

BEGONIAS—Bessie Raymond Buxton—*Hale, Cushman & Flint*, 128 p., plates, \$1.

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Psychology

PRINCIPLES OF GENERAL PSYCHOLOGY—Ellis Freeman—*Holt*, 530 p., \$2.75. An elementary textbook in which the author has "avoided any attempt to tell professional colleagues what psychology may be; but I have tried to give a workable impression of it to students." In the course of presenting principles, practical questions are answered. Dr. Freeman uses gestalt conceptions in learning and perception mainly, where he believes them to be peculiarly effective. Elsewhere he has avoided them.

Science News Letter, September 9, 1939

Ethnology

ETHNOGRAPHIC NOTES ON THE WASHO—Robert H. Lowie—*Univ. of Calif. Press*, 52 p., 50c.

Science News Letter, September 9, 1939

Chemistry

HOW TO MAKE AND USE A SMALL CHEMICAL LABORATORY—Raymond Francis Yates; rev. by S. A. Pellerano—*Henry*, 186 p., \$1. Here is a book for beginners setting forth the fundamentals of elementary chemistry in easily understandable terms.

Science News Letter, September 9, 1939

Hygiene—Education

TESTS AND MEASUREMENTS IN HEALTH AND PHYSICAL EDUCATION—Charles Harold McCloy—*Crofts*, 392 p., \$3.

Science News Letter, September 9, 1939

Psychology

GENERAL PSYCHOLOGY—Lawrence Edwin Cole—*McGraw-Hill*, 688 p., \$3.50. This text by the professor of psychology at Oberlin College is one of a series of publications in psychology of which Dr. J. F. Dashiell is consulting editor.

Science News Letter, September 9, 1939

Statistics

STATISTICAL YEAR-BOOK OF THE LEAGUE OF NATIONS, 1938-39—League of Nations—*Columbia Univ. Press*, 330 p., \$2.50. Despite the world unrest, the League's non-political services, which probably will be viewed historically as its most important activity, continue their task of gathering and disseminating the facts. This is the latest annual volume of a series begun in 1927.

Science News Letter, September 9, 1939

Physiology

AN INTRODUCTION TO ANIMAL PHYSIOLOGY—W. B. Yapp—*Oxford*, 319 p., \$3. Compact but complete treatment, for students of university level, by a well-known British physiologist.

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Genetics

AN INTRODUCTION TO MODERN GENETICS—C. H. Waddington—*Macmillan*, 441 p., \$4. An impressive and thoroughly up-to-date text by a leading British geneticist.

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Entomology

THE WORLD OF INSECTS—Carl D. Duncan and Gayle Pickwell—*McGraw-Hill*, 409 p., \$3.50. Intended for popular reading, but easily meriting a place on school and college reference shelves, is this well-illustrated, informative book on the natural history of insects. It contains a considerable amount of matter not usually included in either popular or technical works on entomology.

Science News Letter, September 9, 1939

Ichthyology

SPECKLED NOMADS: A Tale of Trout in Two Rivers—H. E. Towner Coston—*Macmillan*, 299 p., \$3. The two trout lives vividly and skillfully individualized, yet not in any sense "personalized", through the author's intimate knowledge of how fish live, his consummate style, and the really magnificent illustrations. One puts down the book with the feeling that he has really known a couple of notable fish.

Science News Letter, September 9, 1939

Botany

TUBERALES OF NORTH AMERICA—Helen M. Gilkey—*Oregon State College*, 63 p., 50c. The interesting but little known group of fungi to which belong the Old-World truffles is here compactly monographed, so far as the North American forms are concerned. Botanists, and especially mycologists, will welcome this publication.

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*First Glances at New Books

Additional Reviews
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Science

SCIENCE AND SOCIAL CHANGE—Jesse E. Thornton, comp.—*Brookings Inst.*, 577 p., \$3. A compilation of the best thoughts of 50 who have looked upon various aspects of science and society. The chapters, addresses and articles reprinted are grouped under the headings: Science, its Nature and Significance; Invention, Industrialism, and Business Management; Economic and Social Accompaniments of Technology, and The Outlook for a More Satisfactory Use of Scientific Knowledge.

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Paleontology

PALAEZOIC FISHES—J. A. Moy-Thomas—*Chemical Pub. Co.*, 149 p., \$2. A small book, but one with a value out of all proportion to its size. It will be seized upon eagerly by paleontologists and ichthyologists alike.

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Zoology

FIELD BOOK OF ANIMALS IN WINTER—Ann Haven Morgan—*Putnam*, 527 p., \$3.50. A worthy addition to Putnam's excellent fieldbook series. Animals described range from lower invertebrates to birds and mammals. There are also several chapters on the ecological aspects of animal life in winter.

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Medicine

THE ROCKEFELLER FOUNDATION ANNUAL REPORT, 1938—*Rockefeller Foundation*, 49 West 49th Street, New York, 515 p. Free upon direct application to the foundation.

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Zoology

BATS—Glover Morrill Allen—*Harvard Univ. Press*, 368 p., \$4. This book presents so many interesting facts about bats that it should go far toward overcoming the unfortunate prejudice that many persons hold against these harmless and useful animals. It is even to be hoped that some will emulate the author and keep bats as pets.

Science News Letter, September 9, 1939

Economics—History

HUNGER AND HISTORY; The Influence of Hunger on Human History—E. Parmalee Prentice—*Harper*, 269 p., \$3. The story of mankind's long and toilsome progress from a condition in which want was the usual and normal thing to the present, wherein abundance can be enjoyed, at least in the more favored parts

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of the world. Popularly written, yet fully documented for the further guidance of those who would read more.

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Zoology

GUIDE TO THE NEW YORK ZOOLOGICAL PARK—Raymond L. Ditmars and Lee S. Crandall—*New York Zoological Soc.*, 258 p., illus., 50c. New in both text and illustrations, this guide replaces a publication of which half a million copies were sold over a period of 40 years. It is more than a guide, for it gives a condensed account of the relationships and natural history of each species in New York's great zoo.

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Conservation

CONSERVATION OF RENEWABLE RESOURCES—E. M. Dahlberg—*C. C. Nelson*, 208 p., \$1. Intended primarily as a guide for teachers, this small book can be read with profit by anyone interested in the conservation and restoration of America's wildlife, timber and other non-mineral resources. It would be a good thing, indeed, if it could be made required reading for every voter.

Science News Letter, September 9, 1939

Ethnology

POMO GEOGRAPHY—Fred B. Kniffen—*Univ. of Calif. Press*, 38 p., 50c. The economic geography of Pomo Indian groups in mid-western California.

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Anthropology

THE NORTHERN PAIUTE BANDS—Omer C. Stewart—*University of California Press*, 22 p., 25c. (Anthropological Records, Vol. 2, No. 3)

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Anthropology

CULTURE ELEMENT DISTRIBUTIONS: IX, GULF OF GEORGIA SALISH—H. G. Barnett—*University of California Press*, 74 p., 75c. (Anthropological Records, Vol. 1, No. 5)

CULTURE ELEMENT DISTRIBUTIONS: X, NORTHWEST CALIFORNIA—Harold E. Driver—*University of California Press*, 136 p., \$1.25. (Anthropological Records, Vol. 1, No. 6)

Science News Letter, September 9, 1939

Public Health

FIGHTING FOR LIFE—S. Josephine Baker—*Macmillan*, 264 p., \$2.75. A delightful autobiography of a crusader in the child welfare movement.

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Radio

BIG BUSINESS AND RADIO—Gleason L. Archer—*American Historical Co.*, 503 p., \$4. An exhaustive and detailed history of broadcasting and lesser phases of radio, accenting the financial and operating aspects. Those who deal with this manifestation of business, science and art will want to read and refer to it.

Science News Letter, September 9, 1939

Ornithology

BIRDS FROM CLIPPERTON ISLAND COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—Alexander Wetmore—*Smithsonian Inst.*, 6 p., 10c.

Science News Letter, September 9, 1939

Botany

MOSSES OF THE PHILIPPINES—Edwin B. Bartram—*Bureau of Science, Dept. of Agriculture and Commerce, Manila, P. I.*, 437 p., 29 pl., \$2. A complete monographic treatment of the mosses of this important tropical archipelago, which will be welcomed by bryologists and by botanists generally.

Science News Letter, September 9, 1939

Regional Study—Bibliography

RECLAMATION, 1902-1928: A SUPPLEMENTAL BIBLIOGRAPHY—John J. Gaul, comp.—*Denver Public Library*, 98 p., \$1.

Science News Letter, September 9, 1939

Zoology

TURTLES OF THE UNITED STATES AND CANADA—Clifford H. Pope—*Knopf*, 348 p., \$3.75. A full account of this most interesting and attractive class of reptiles, scientifically complete yet popularly readable, with superb photographic illustrations.

Science News Letter, September 9, 1939

Botany

TREES OF THE SOUTH—Charlotte Hilton Green—*Univ. of North Carolina*, 551 p., \$2.50. A regional tree flora that incorporates much lore and literature along with its botany. Informally written, it can be read with pleasure by persons without formal botanical training, yet it will be useful also on the botanist's reference shelf. Excellently illustrated.

Science News Letter, September 9, 1939

Plant Pathology

ELEMENTS OF PLANT PATHOLOGY—Irving E. Melhus and George C. Kent—*Macmillan*, 493 p., \$4. A modern text, in which full advantage is taken of the latest discoveries in a rapidly expanding field of scientific knowledge and practice.

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